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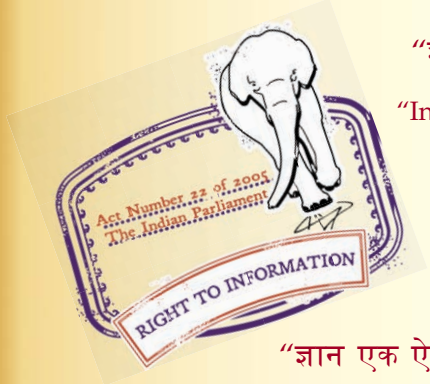
IS 4547 (1992): Receivers for Monochrome Television Broadcast Transmissions [LITD 7: Audio, Video and Multimedia Systems and Equipment]



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Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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भारतीय मानक

एकवर्णी दूरदर्शन प्रसारण संचार के लिए रिसीवर — विशिष्टि

(तीसरा पुनरीक्षण)

Indian Standard

RECEIVERS FOR MONOCHROME TELEVISION BROADCAST TRANSMISSIONS — SPECIFICATION

(Third Revision)

(Incorporating Amendment No. 1)

UDC 621.397.621

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Group 5

Radio Communications Sectional Committee, LTD 20

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Radio Communications Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

The object of this standard is to lay down the performance requirements of monochrome television receivers to ensure quality and reliability. The limits of performance have been so chosen as to ensure quality of such receivers and at the same time ensure sufficient freedom in design by the manufacturers. The performance requirements have also been so chosen as to provide consumer satisfaction and in-built safety measures.

This standard was originally published in 1968 and revised in 1978 and 1985. This revision has been undertaken to modify some of the requirements based on the experience gained in the use of this standard.

A scheme for labelling environment friendly products known as ECO-Mark is introduced at the instance of the Ministry of Environment and Forests. The ECO-Mark shall be administered by the Bureau of Indian Standards (BIS) under the *BIS Act*, 1986 as per the Resolution No. 71 dated 20 February 1991 published in the Gazette of Government of India, under the *Environment (Protection) Act*, 1986. For a product to be eligible for ECO-Mark it shall also carry the Standard Mark of BIS for quality besides meeting additional optional environment friendly (EF) requirements. The environment friendly requirements for monochrome television receivers are being included through Amendment No. 1 to this standard.

This edition 4.1 incorporates Amendment No. 1 (April 1996). Side bar indicates modification of the text as the result of incorporation of the amendment.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

RECEIVERS FOR MONOCHROME TELEVISION BROADCAST TRANSMISSIONS — SPECIFICATION

(Third Revision)

1 SCOPE

1.1 This standard covers the general and performance requirements for monochrome television receivers.

1.1.1 The monochrome television receivers covered by this standard are intended for television reception on 625 line system and having negative picture modulation with associated frequency modulation sound reception on the intercarrier sound system. [The standard system B of International Radio Consultative Committee (*see* 11453 : 1985 'Characteristics of systems for monochrome and colour television')].

2 REFERENCES

The Indian Standards listed in Annex A are necessary adjuncts to this standard.

3 TERMINOLOGY

For the purpose of this standard, the terms and definitions covered in IS 1885 (Part 24) : 1967 and IS 4545 (Part 1) : 1983 shall apply.

4 GENERAL REQUIREMENTS

4.1 Electrical Requirements

4.1.1 *Frequency Range*

The receivers shall be designed for reception in the following channels:

Band	*Channel*	*Frequency Range*
I	2	47 to 54 MHz
	3	54 to 61 MHz
	4	61 to 68 MHz
II	5	174 to 181 MHz
	6	181 to 188 MHz
	7	188 to 195 MHz
III	8	195 to 202 MHz
	9	202 to 209 MHz
	10	209 to 216 MHz
	11	216 to 223 MHz
	12	223 to 230 MHz

4.1.2 *Intermediate Frequency*

The intermediate frequency shall be so chosen that minimum interference is caused from the high power transmitters working in the high frequency broadcast bands. The intermediate frequencies are as follows:

Vision	38.9 MHz
Sound	33.4 MHz

4.2 Power Supply Requirements

4.2.1 *Power Supply*

The receiver shall be designed to operate on mains power supply as specified below:

Nominal mains voltage	240 V, 50 Hz ± 2 percent
Limits of mains voltage	200 V to 250 V
Rated voltage	240 V

4.2.1.1 If the receiver is designed to operate from lead acid accumulator, it shall meet the following requirements:

Type of Power Supply	*Rated Voltage* V	*Operating Voltage*		
		Max V	*Nom* V	*Min* V
Lead acid accumulator [6 cells in series (12 V) or 12 cells in series (24 V)]:				
1) Voltage per cell	2.0	—	2.0	1.8
2) Under charge	—	—	2.2	—
3) For car receivers	—	2.6	2.4	—

NOTE — Where manufacturers define a higher minimum voltage than 1.8 V per cell, this higher voltage shall be considered to be the minimum value.

4.2.2 The power consumption of the mains operated receiver shall not exceed 120 watts. For battery operated receivers the current drain shall not exceed 2.5 A for 24 V battery operation and 5A for 12 V battery operation.

4.2.3 *Operation Under Under-Voltage Conditions*

At the specified under-voltage, following tests shall be carried out and the requirements specified in Table 1 shall be met with:

a) Visual and operational check,

b) Picture size,

c) Noise limited sensitivity, and

d) Maximum useful audio output power.

Table 1 Performance Requirements

(*Clauses* 4.2.3, 6.1 *and* 6.2)

Sl No.	Characteristic	Ref to IS 4545	Requirements
(1)	(2)	(3)	(4)
0	GENERAL		
	a) *Visual and Operational Check:*	—	The receiver shall be in normal working condition (*see* **2.18** of IS 4545 (Part 1) : 1983)
	1) Visual examination of the receiver		
	2) Checking all controls for their intended operation		
	3) Check for picture reception		
	b) *Antenna input impedance*	—	The input impedance of the receiver at the antenna terminals shall have a nominal value of 300 Ω balanced and the VSWR in the entire frequency range shall not exceed 4. If the input impedance is 75 Ω unbalanced it shall be provided with a balun (balance to unbalance transformer) to match with the antenna input impedance of 300 Ω balanced.
1	VISION		
	a) *Picture Quality*	Part 3	
	1) Picture size		The picture size is defined by the following: i) Maximum picture height, ii) Maximum picture width, and iii) Effective picture area
	2) Aspect ratio		The aspect ratio shall be **4.3** within a tolerance of ± 5 percent
	3) Geometrical distortion		i) *Picture outline distortion* — Not more than 4 percent in each direction (vertical and horizontal) ii) *Non-linearity due to scanning* — Total distortion not more than 6 percent in each direction (vertical and horizontal), and iii) *Ripple distortion due to mains* — Not to exceed 0.5 percent of picture tube width for a difference of approximately 1 Hz between the mains frequency and the frame frequency
	4) Brightness		i) *Maximum highlight brightness* — 120 NITS or more with respect to 2 NITS blackness level ii) *Effect of brightness variation on extra high tension* (*EHT*) — By variation of brightness control from minimum to maximum, the EHT should not vary by more than 15 percent of the rated voltage
	5) Contrast		i) *Maximum available contrast ratio* — 80:1 or more with respect to 2 NITS blackness level ii) *Minimum available contrast ratio* — 20:1 or less with respect to 2 NITS blackness level
	6) Definition and focus		The vertical and horizontal definition shall be better than 275 lines when the standard test card is set for best focus at the centre of the screen
	7) Brightness transfer characteristic (gamma)		The receiver when adjusted for test card display shall distinguish at least eight out of ten tonal gradation steps
	b) *Synchronizing Quality*	Part 4	
	1) Quality of synchronization		*Quality of Interlace* — Better than 45/55
	2) Hum-bar		Not to exceed 5 percent when measured as percentage of voltage amplitude of video signal or luminance ratio with reference to a white field with the contrast control adjusted for standard image

Table 1 (*Continued*)

Table 1 (*Continued*)

Sl No.	Characteristic	Ref to IS 4545	Requirements
(1)	(2)	(3)	(4)
	c) *Sensitivity*	Part 5	
	1) Gain-limited sensitivity		Equal to or better than: i) – 75 dB (mW) for Band I; and ii) – 69 dB (mW) for Band III
	2) Noise-limited sensitivity		For a signal to noise ratio of not less than 30 dB at the picture tube electrodes corresponding to a standard image, this shall be equal to or better than: i) – 69 dB (mW) for Band I, and ii) – 63 dB (mW) for Band III
	3) Automatic gain control characteristics		The signal at the picture tube electrodes shall not vary by more than 6 dB when the input television signal is varied between – 68 dB (mW) and – 16 dB (mW)
	4) Synchronizing sensitivity		Equal to or better than: i) – 81 dB (mW) for Band I, and ii) – 75 dB (mW) for Band III
	5) Maximum usable input signal level (single input)		– 10 dB (mW) [0.1 mW]
	d) *Selectivity and Response to Undesired Signals*	Part 6	
	1) Single signal selectivity		The rf pass band shall be such that: i) the 6 dB band width of the complete IF amplifier shall be not less than 3.5 MHz, ii) The sound carrier is attenuated by at least 20 dB, iii) The picture carrier of the higher adjacent channel is suppressed by at least 30 dB, and iv) The sound carrier of the lower adjacent channel is suppressed by at least 30 dB
	2) Intermediate frequency interference ratio		Better than 30 dB for Band I, and better than 40 dB for Band III
	3) Image interference ratio		Better than 40 dB
	4) Unbalance ratio of balanced receiver input		Better than 36 dB
	5) Mains interference		Better than 40 dB
	6) Spurious response		Under consideration
	e) *Fidelity*	Part 7	
	1) Modulation frequency response		Within 0 ± 6 dB at least up to 3.5 MHz
	2) Step response		Under consideration
	3) Black level stability		i) *Variation with input signal* — Not more than 5 percent, and ii) *Variation with mains voltage* — The black level shall not vary by more than 5 percent for input mains voltage between 200 to 250 V ac
	f) *Stability*		
	1) Variation of tuning frequency (Test points — IF output of Tuner)	Part 2	i) *Frequency drift during the initial warm-up period* — The frequency drift of the local oscillator shall not be more than 200 kHz in 15 minutes, and ii) *Frequency drift due to change of ambient temperature* — The frequency drift of the local oscillator shall not be more than 600 kHz for a temperature change from 10 to 40°C
	2) Synchronizing stability	Part 4	i) *Frequency drift of time base circuit in the absence of synchronization after five minutes of switching on the receiver* — The variation of the free running frequency of the time base circuit during a period of operation of 1 h shall not exceed ± 3 percent for vertical and ± 1 percent for horizontal, and

Table 1 (*Continued*)

Table 1 (*Continued*)

Sl No.	Characteristic	Ref to IS 4545	Requirements
(1)	(2)	(3)	(4)
			ii) *Frequency shift of time base circuit due to variation of the supply voltage* — The variation of the free running frequency of the time base circuit (both vertical and horizontal) due to a supply voltage variation of 200 to 250 V shall not be more than ± 1.0 percent of the free running frequency measured at the nominal mains voltage of 240 V
	3) Line scan synchronizing range	Part 4	*Lock-in-range* — The range between two points at which either horizontal or vertical synchronization gains control shall be better than [drift as obtained/measured in Sl No. 1(f) (2) (i) +1 percent] both for vertical and horizontal
	g) *Radiation* (*Optional*)		When measured in accordance with IS 4546 : 1983 the limits of radiation from television receivers shall be as specified in IS 6842 : 1977
2	ELECTRICAL AND ACOUSTIC MEASUREMENTS AT AUDIO FREQUENCY	Part 9	
	a) *General*		
	1) Maximum useful audio output power		Not less than 0.5 W for screen sizes equal to or less than 340 mm and not less than 1.0 W for screen sizes greater than 340 mm
	2) De-emphasis		Time constant of the de-emphasis network shall be 50 μs ± 5 percent
	b) *Sensitivity*		
	Noise-limited input signal level		i) For signal-to-noise ratio of not less than 30 dB, ii) Better than – 81 dB (mW) for Band I, and iii) Better than – 75 dB (mW) for Band II
	c) *Interference*		
	1) Selectivity (two signal method)		The selectivity when measured by two signal method and for an audio output of – 10 dB with reference to standard output and with the incorporation of audio band pass filter while taking the measurement shall be at least – 6 dB at 200 kHz around the centre carrier of sound
	2) Spurious response		Under consideration
	3) Hum		At least 36 dB below the maximum useful audio output
	d) *Fidelity*		
	Electrical audio frequency response		The electrical frequency response shall be within ± 6 dB over the range 100 Hz to 7.5 kHz (when referred to response at 1 kHz) after allowing for 50 μs pre-emphasis characteristic provided at the transmission
	e) *Acoustic Feedback*		There shall be no acoustic feedback for maximum useful audio output power when measured in accordance with IS 2731 : 1964
3	MISCELLANEOUS MEASUREMENTS		
	Microphonic effects on the picture	Part 2	Microphonic effects shall not be noticeable when the volume control is so adjusted as to obtain maximum useful audio power on 100 percent of modulation peaks

4.3 Controls

A minimum number of controls consistent with ease of operation and maintenance shall be provided. All controls shall be legibly marked. The controls specified in **4.3.1** are mandatory whereas the controls specified in **4.3.2** to **4.3.4** are recommended.

4.3.1 These controls are meant to be easily available for adjustment by the viewer:

a) Channel selection,

b) Brightness,

c) Contrast,

d) Supply on/off switch (*see* Note),

e) Volume control (for sound) (*see* Note), and

f) Fine tuning (where automatic tuning control facility is not provided).

NOTE — These controls may be separate or single.

4.3.2 These controls are meant to be easily available for adjustment by the viewer and shall normally be accessible to the viewer:

a) Tone control, and

b) Vertical hold.

NOTE — Vertical hold control shall be accessible if and when provided in the receiver.

4.3.3 *Pre-set Controls not Accessible to the Viewer*

These controls which may not be readily accessible to the viewer shall be capable of being adjusted by simple tools like screw drivers. These controls shall be set by a skilled technician only and are not expected to be adjusted by the viewer:

a) Vertical height,

b) Vertical linearity,

c) Horizontal width,

d) Horizontal linearity, and

e) Horizontal hold.

4.3.4 *Adjustments/Settings by Means of Tools*

These adjustments/settings shall be set by a skilled technician only and are not intended to be adjusted by the viewer:

a) Intercarrier trap,

b) Focus,

c) AGC setting,

d) Picture outline distortion, and

c) AM rejection.

4.4 Terminals

4.4.1 The following terminals shall be accessible for connections:

a) Antenna input terminals;

b) External speaker socket, if provided;

c) Earphone socket, if provided; and

d) Separate sockets for video and audio input/output, if provided.

5 SAFETY REQUIREMENTS

5.1 The television receivers shall conform to the following safety requirements. These tests shall be carried out in accordance with IS 616 : 1986 and shall meet the requirements specified therein:

a) Ionizing (X-ray) radiation (*see* **6** of IS 616 : 1986),

b) Shock hazard under normal operating conditions (*see* **9.1.1** of IS 616 : 1986),

c) Insulation resistance and dielectric strength (*see* **10.3** of IS 616 : 1986), and

d) Mechanical strength of picture tubes and protection against effects of implosion (*see* **18** of IS 616 : 1986).

NOTE — In case of availability of certificate regarding implosion proofness from picture tube manufacturers the test need not be carried out.

5.2 Special care shall be taken to avoid any possibility of an electric shock from the receiver through the antenna. This may be achieved either by the use of an isolating mains transformer/SMPS or by the use of a safety capacitor of 1 500 *p*F or lower capable of withstanding at least 1 000 V dc. In each arm of the antenna input to the receiver.

6 PERFORMANCE REQUIREMENTS

6.1 Methods of Measurements

The general test conditions and methods of measurements of performance requirements specified in Table 1 shall be in accordance with IS 4545 (Parts 1 to 9) and IS 4546 : 1983.

6.2 Performance Requirements

The performance requirements of television receiver shall be in accordance with Table 1.

7 MARKING

7.1 Each television receiver shall be legibly and indelibly marked with at least the following information:

a) Indicating the source of manufacture;

b) Model designation and serial number;

c) Layout plan of the components on the printed circuit board;

d) Input supply voltage and (if applicable) frequency;

e) Nominal power consumption;

f) Antenna input terminal with impedance value;

g) When provided, speaker sockets, tape recording sockets and sockets for video and audio input;

NOTE — In case of euro connectors, the necessary terminal information may not be marked on the receiver. In such cases, it shall be provided separately in the instruction manual.

h) Additional markings for safety, such as high voltage points with their voltage value; and

j) Country of manufacture.

7.1.1 A precautionary note shall appear prominently on the outer surface of back cover to ensure proper disconnection of power supply before removing back cover, for example:

'DO NOT REMOVE THE BACK COVER WITHOUT TOTALLY DISCONNECTING THE SUPPLY'

7.1.2 The television receivers may also be marked with the Standard Mark.

7.1.3 The television receivers may also be marked with ECO-Mark.

8 OPERATING AND INSTRUCTION MANUAL

8.1 An operating instruction manual containing information relating to installation, operation, routine maintenance and safety precautions shall be made available with each receiver. The manufacturer would particularly specify the critical components for which adequate care needs to be taken to ensure proper replacement at the time of servicing.

8.2 On request, customers shall be provided with circuit diagrams of the receiver indicating waveforms, voltages, other tests and monitoring details along with components and parts identification list and layout.

9 TESTS

9.1 Classification of Tests

9.1.1 *Type Tests*

The tests specified in Table 2 shall constitute type tests and shall be carried out in the sequence mentioned therein.

9.1.1.1 *Number of samples*

For type tests, number of television receivers shall be three of the same model, type and make selected preferably at random from a regular production lot.

9.1.1.2 *Criteria of acceptance*

There shall be no single failure in any of type tests. In case of failure, twice the number of television receivers shall be taken and subjected to the tests in which failure has occurred and other tests that have bearing on the test results. No failure shall be permitted in the retests.

Table 2 Schedule of Type Tests

(*Clause* 9.1.1)

Group	Test	Clause Ref of This Standard	No. of TV Receivers
(1)	(2)	(3)	(4)
0	Check for general requirements	4	
	Check for safety requirements	5	
	Check for marking requirements	7	**3**
	Tests for performance requirements	6.2 and Table 1	
1	Bump	9.2.1	**1**
2	Dry heat	9.2.2	**1**
	Damp heat cyclic	9.2.3	
	Cold	9.2.4	
3	Operating life	9.3	**1**

9.1.2 *Routine Tests*

The following shall constitute the routine tests and shall be carried out on each and every television receiver:

a) Visual and operational check [*see* **6** (a) of Table 1],

b) Shock hazard under normal operating conditions (*see* **9.1.1** of IS 616 : 1986), and

c) Insulation resistance and dielectric strength test (*see* **10.3** of IS 616 : 1986).

9.1.3 *Acceptance Tests*

The following shall constitute the acceptance tests which shall be carried out on television receivers that have successfully passed the routine tests (*see* **9.1.2**).

NOTE — *See* Table 1 and **9.3** for reference.

a) *Vision*

1) *Picture quality*

i) Picture size,

ii) Aspect ratio,

iii) Geometric distortion,

iv) Definition and focus,

v) Brightness transfer characteristic (gamma), and

vi) Check for picture reception.

2) *Sensitivity*

i) Gain-limited sensitivity,

ii) Noise-limited sensitivity,

iii) Synchronizing sensitivity, and

iv) Automatic gain control characteristics.

3) *Single-signal selectivity*

4) *Stability*

i) Variation of tuning frequency,

ii) Synchronizing stability, and

iii) Line scan synchronizing range.

b) *Electrical and Acoustic Measurement at Audio Frequency*

1) Maximum useful audio output power,

2) Noise limited input signal level, and

3) Electrical audio frequency response.

c) *Miscellaneous Measurements*

Power consumption.

d) *Operating life* — 48 hours.

9.1.3.1 Television receivers shall be selected and subjected to acceptance tests to ascertain the conformity of each lot to the requirement specified. A recommended sampling plan and acceptance criteria is given in Annex B.

9.2 Environmental Tests

9.2.1 *Bump Test*

The receiver shall be subjected to bump test carried out in accordance with IS 9000 (Part 7/ Sec 2) : 1979, the number of bumps being 500 ± 10 and acceleration being 400 m/s^2. After this test the receiver shall conform to the applicable performance requirements specified in **9.2.5**. This test shall be carried out under packed conditions.

9.2.2 *Dry Heat Test*

The receiver shall be subjected to dry heat test of severity + 55°C for 16 hours (unless a higher severity is called for), carried out in accordance with IS 9000 (Part 3/Sec 5) : 1977. The test shall be carried out when the receiver is OFF. After recovery, the receiver shall conform to the applicable performance requirements specified in **9.2.5**. The duration of the recovery shall be 2 hours.

9.2.3 *Damp Heat Cyclic Test*

The receiver shall be subjected to damp heat cyclic test (No. of cycles — 2) in accordance with IS 9000 (Part 5/Sec 1) : 1981. After recovery, the receiver shall conform to the applicable performance requirements specified in **9.2.5**. The duration of recovery shall be 24 hours. The test shall be carried out when the receiver is in OFF condition.

9.2.4 *Cold Test*

The receiver shall withstand a cold test of severity – 10°C for 2 hours carried out in accordance with IS 9000 (Part 2/See 4) : 1977. After recovery, the receiver shall conform to the applicable performance requirements specified in **9.2.5**. The duration of recovery shall be 2 hours. The test shall be carried out when the receiver is in OFF condition.

9.2.5 *Post Measurements After Each Environmental Test*

The following functional checks shall be made after each environmental test (*see* **9.2.2** to **9.2.4**) and the requirements specified in Table 1 shall be met with:

a) Noise limited sensitivity,

b) Synchronizing sensitivity,

c) Variation of tuning frequency,

d) Maximum useful audio output power, and

e) Safety tests:

1) Shock hazard under normal operating conditions, and

2) Insulation resistance and dielectric strength.

9.3 Operating Life Test

The television receiver shall be subjected to operating life test consisting of 5 hours operation and one hour rest period for total operating period of 1 000 hours under laboratory atmospheric conditions and at rated voltage with suitable video and audio modulation. At the end of the operating life duration, the following functional checks shall be carried out and the requirements specified in Table 1 shall be met with:

a) Noise limited sensitivity,

b) Synchronizing sensitivity,

c) Variation of tuning frequency, and

d) Maximum useful audio output power.

NOTES

1 Allowance should be made for normal attention of the television receiver.

2 When this test is called for as part of acceptance tests, the operating period shall be limited to 48 hours.

3 With static video modulation pattern there exists a possibility of a permanent impression (burn-in, etc) left on the picture tube screen. Suitable measures like rolling the picture at a slow rate can be resorted to, to avoid the impression.

4 The loudspeaker may be substituted by a dummy load.

10 ADDITIONAL OPTIONAL REQUIREMENTS FOR ECO-MARK

10.1 General Requirements

10.1.1 The television receivers shall conform to the requirements pertaining to quality, safety and performance prescribed in this standard.

10.1.2 The manufacturer shall produce the consent clearance as per the provisions of *Water (PCP) Act*, 1974, *Water (PCP) Cess Act*, 1977 *and Air (PCP) Act*, 1981, along with the authorization if required under *Environment (Protection) Act*, 1986 and the Rules made thereunder to the Bureau of Indian Standards while applying for the ECO-Mark.

10.1.3 The television receivers may display a list of critical components/cautionary notice as applicable.

10.1.4 The television receivers/packaging may display in brief the criteria based on which the product has been labelled environment friendly.

10.1.5 The television receivers shall be sold along with instructions for proper use so as to maximize product performance and minimize wastage.

10.1.6 The material used for packing shall be recyclable or biodegradable and the parameters evolved under the Scheme of Labelling Environment Friendly Product (SLEFP) on the specific subject of packaging shall apply.

10.2 Product Specific Requirements

10.2.1 CFC and other aromatic and halogenated hydrocarbons shall not be used for cleaning purpose during manufacturing/ assembling.

10.2.2 The Electromagnetic radiation from TV Receivers shall not exceed the limits specified in IS 6842 : 1977 when tested in accordance with IS 4546 : 1983.

10.2.3 The power consumption shall not exceed:

50 W for screen sizes above 36 cm but below 51 cm; and 75 W for screen sizes of 51 cm and above.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
616 : 1981	Safety requirements for mains operated electronic and related apparatus for household and similar general use (*second revision*)
1885 (Part 24) : 1967	Electrotechnical vocabulary: Part 24 Broadcasting, sound and television
2731 : 1964	Methods of measurements on receivers for frequency modulation broadcast transmissions
4545	Methods of measurement on receivers for television broadcast transmissions:
(Part 1) : 1983	General considerations (*first revision*)
(Part 2) : 1983	Tuning properties and general measurements (*first revision*)
(Part 3) : 1983	Geometrical properties of the picture (*first revision*)
(Part 4) : 1983	Synchronizing quality (*first revision*)
(Part 5) : 1983	Sensitivity (*first revision*)
(Part 6) : 1983	Selectivity and response to undesired signals (*first revision*)
(Part 7) : 1983	Fidelity (*first revision*)
(Part 8) : 1983	Compatibility with audio visual recording equipment (*first revision*)
(Part 9) : 1983	Electrical and acoustic measurements at audio frequency (*first revision*)
4546 : 1983	Methods of measurement of radiated and conducted interference from receivers for amplitude modulation, frequency modulation and television broadcast transmissions (*first revision*)
4905 : 1968	Methods of random sampling
6842 : 1977	Limits for electromagnetic interference (*first revision*)
9000	Basic environmental testing procedures for electronic and electrical items:
(Part 2/Sec 4) : 1977	Part 2 Cold test, Section 4 Cold test for heat dissipating items with gradual change of temperature
(Part 3/Sec 5) : 1977	Part 3 Dry heat test, Section 5 Dry heat test for heat dissipating items with gradual change of temperature
(Part 5/Sec 1) : 1981	Part 5 Damp heat (cyclic) test, Section 1 16+8 h cycle
(Part 7/Sec 2) : 1979	Part 7 Impact test, Section 2 Bump

ANNEX B

(*Clause* 9.1.3.1)

SAMPLING AND CRITERIA FOR CONFORMITY

B-1 Lot

B-1.1 All the television receivers of the same model and type having the same design and manufactured by the same techniques under essentially similar conditions of production.

B-1.1.1 Samples shall be taken and tested to ascertain the conformity of each lot for acceptance tests.

B-2 SCALE OF SAMPLING

B-2.1 Receivers shall be taken at random according to col 1, 2 and 3 of Table 3 (*see* IS 4905 : 1968).

B-3 NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

B-3.1 Receivers shall be drawn from each lot according to col 1 and 2 of Table 3 and subjected to the acceptance tests specified in **9.1.3**. If a receiver fails in any one of the acceptance tests, it shall be called a defective. If the number of defectives found in the first sample (*see* col 2) is zero (*see* col 5), the lot shall be considered as conforming to the acceptance tests. If the number of defectives is as lequal to or greater than two (*see* col 6), the lot shall be considered as not conforming to the acceptance tests.

B-3.2 If the number of defectives is equal to one, further sample of receivers shall be taken according to col 3 of Table 3 and tested for all the acceptance tests. If the number of defectives in the combined sample (*see* col 4), the lot shall be considered as conforming to the acceptance test; otherwise rejected.

Table 3 Scale of Sampling and Criteria for Conformity

(*Clause* B-2.1)

Lot Size	First Sample N_1	Second Sample N_2	Combined Sample $(N_1 + N_2)$	Acceptance Number	Rejection Number
(1)	(2)	(3)	(4)	(5)	(6)
Up to 150	5	5	10	0	2
151 to 300	8	8	16	0	2
301 and above	13	13	26	0	2

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

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